Amendments to the Specification

Please rewrite the paragraph beginning at page 1, line 13 as follows:

--The present invention is related to co-pending U.S. patent application entitled "Variable Speed Recording Method and Apparatus for a Magnetic Tape Drive", invented by Beavers et al., and having an internal docket number of 9086/101 and a serial number of 09/176,079, now U.S. Patent 6,307,701, filed concurrently herewith on October 20, 1998, and co-pending U.S. patent application entitled "Fine Granularity Rewrite Method and Apparatus for Data Storage Device", invented by Zaczek, and having an internal docket number of 9086/106 and a serial number of 09/176,015, now U.S. Patent 6,381,706, filed concurrently herewith on October 20, 1998, and co-pending U.S. patent application entitled "Multi-level Error Detection and Correction Technique for Data Storage Recording Device", invented by McAuliffe et al., and having an internal docket number of 9086/102 and a serial number of 09/176,014, now U.S. Patent 6,367,047, filed concurrently herewith on October 20, 1998, all of which are commonly owned and all of which are hereby incorporated by reference.--

Please rewrite the paragraph beginning on page 5, line 6 as follows:

--Each pair of ~~like-azimuth (like type)~~ heads oriented along identical azimuth angles (i.e., being both of type "A" or both of type "B") is separated vertically on the surface of the drum so that each read head passes over a given track with a longitudinal offset relative to one another at nominal tape speed (i.e., at the tape speed used for writing). The width of each head (also referred to herein as head width or gap width) is also selected so as to create an overlap between the two scans of the track by the corresponding two ~~like-azimuth~~ identical type read heads.--

Please rewrite the paragraph beginning on page 5, line 12 as follows:

--The combination of preferred dimensions for the head width and the vertical offset of the ~~like-azimuth~~ heads having identical azimuth angles on the

drum surface serve to create a combined coverage of the overlapping scans of greater than 100% of the entire recordable area of the tape medium. In addition, it is critical that the dimensions chosen are adequate to provide sufficient coverage of an appropriate type track such that the recorded data can be sensed. Yet, the width must not be so wide as to overlap another ~~like-azimuth~~ track recorded along an identical azimuth angle in a single scan. Further, the drum of the present invention is intended for use in a variable speed tape device devoid of complex tracking circuits. Therefore, the selected dimensions need to assure adequate coverage at a broad range of tape speeds up to the write operation nominal speed (referred to herein as 1X speed) as well as lower speeds.--

Please rewrite the paragraph beginning on page 6, line 3 as follows:

--The simulation model of the present invention then computes the coverage of the read heads over the simulated tracks by determining the geometric dimensions of the heads' motion over the tracks (ignoring analog imperfections such as magnetic media flaws). The same simulation is run for a range of tape speeds, a range of head widths (gap widths) and a range of ~~like-azimuth head~~ physical offsets for heads having identical azimuth angles. Other parameters of the simulation may also be varied such as the number of ~~like-azimuth~~ heads having identical azimuth angles, etc.--

Please rewrite the paragraph beginning at page 9, line 17 as follows:

--Preferred dimensions for placement of the heads on the drum are shown in figure 3. All dimensions are expressed in millimeters with the primary reference being the lower drum surface 308. Those skilled in the art will recognize the criticality of tight tolerances on such high speed, high density storage devices. The dimensions shown are exact for a particular application. Each application may have unique dimensions and associated tolerances. Critical dimensions in the operation of the drum of the present invention for purposes of overscanning are those that determine the offsets between pairs of

~~like-azimuth~~ heads having identical azimuth angles. In other words, dimensions determining the relative positions of heads 71A and 71B are critical to the overscan reading of type B tracks. Identical dimensions are used in setting the relative positions of heads 72A and 72B to assure accurate overscan reading of type A tracks.--

Please rewrite the paragraph beginning at page 9, line 28 as follows:

--The critical dimensions for performing useful overscan reading of tracks by a pair of ~~like-azimuth~~ heads having identical azimuth angles include: the head spacing 310, the radial offset 312 and the gap width 302. As noted above, in the preferred embodiment, identical dimensions are used to positions the type B read heads relative to one another. Relative positioning of type A heads and type B heads is determined primarily by vertical offset 314 and the radial offset 316. These dimensions are determined in accordance with the nominal track width and any gap desired between adjacent ~~unlike-azimuth~~ tracks recorded along different azimuth angles. The plot of figure 5 shows useful ranges of head offset spacing values and tape speeds for gap widths of 15 microns and track spacing of 9 microns.--

Please rewrite the paragraph beginning at page 10, line 6 as follows:

--The head positioning of dual read heads for each type of track enables the drum of figure 3 to perform overscan reading of helical scan tracks at full speed (also referred to herein as 1X speed or writing speed) without the need for complex tracking control circuits and mechanisms within the tape device. Rather, the above dimensions help assure that, between the two heads, all portions of a particular track will be adequately covered at speeds up to 1X. The two heads for each azimuth type overlap one another to a degree that their combined area (their effective coverage) of scan is greater than approximately 100% of the track pair width (the sum of the widths of adjacent A and B tracks). It is also critical that the gap width of each head is not so large as to span from

one track to another ~~like-azimuth~~ track recorded along an identical azimuth angle.--

Please replace the Abstract with the following:

--A helical scan drum design for use in non-tracking tape devices which assures 70% coverage of a track to be read by overscanning with at least two read heads at approximate 1X speed. The present invention further provides a simulation method for evaluating potential drum designs for such overscan applications. The preferred drum design uses pairs of ~~like-azimuth~~ read heads having identical azimuth angles and positioned on the rotating drum such that in combination they overlap the scan of a track by 130% the track width. These dimensions assure at least 70% coverage of each track by at least one of the pair of heads at up to 1X speed while assuring no overlap with another ~~like-azimuth~~ recorded track recorded along an identical azimuth angle. The simulation method allows for evaluation of potential drum designs by accepting parameters describing the intended drum application and then simulating track read operations over a plurality of simulated tracks to determine the efficacy of the design over a range of tape speeds and gap widths. Designs that simulate successful reading of a sufficient threshold number of tracks over a sufficiently broad range of tape speeds may then be selected for further test and evaluation.--

Please rewrite the paragraph beginning at page 14, line 17 as follows:

--The following Matlab listing describes the preferred embodiment for simulating the design of a drum in accordance with the present invention. Matlab is a commercially available computational software library that allows a designer to easily construct and manipulate a simulation program such as the above described general solution. In the preferred embodiment, a free software package called GNU Octave provides a high level language, primarily intended for numerical computations. It is a free software product distributed under the GNU General Public License and available from the Free Software Foundation.

The package was developed in part by John W. Eaton at ~~he~~ the University of Wisconsin Madison in the Department of Chemical Engineering. The package is widely available on the Internet.--